

FULL VERSION OF PENDING CLAIMS

Claims 1-5 (Cancelled)

Claim 6 (Currently Amended): A carbon based ~~protective padding~~ spacer layer for a MEMS device, the carbon based ~~protective padding~~ spacer layer ~~further adapted to~~ for accurately and reliably establishing a one nanometer spacing between a conducting surface on the MEMS device and a tunneling tip, the carbon based ~~protective padding~~ spacer layer comprising a film of fullerene C₆₀ having a thickness of one molecule, said film located at the conducting surface between the tunneling tip and the conducting surface.

Claim 7 (Previously Presented): A microelectromechanical system (MEMS) device including a diaphragm comprising a conducting surface, the MEMS device further comprising exactly one layer of C₆₀ fullerene on the conducting surface.

Claim 8 (Previously Presented): The MEMS device of claim 7, wherein the conducting surface includes gold.

Claim 9 (Previously Presented): The MEMS device of claim 8, where the C₆₀ fullerene is deposited on the gold surface by sublimation.

Claim 10 (Previously Presented): The MEMS device of claim 8 where the C₆₀ fullerene is deposited on the gold surface by chemisorbtion.

Claim 11 (Previously Presented): The MEMS device of claim 7 further comprising a single event pipe containing a gas that reacts with carbon byproducts.

Claim 12 (Currently Amended): A mechanically adjustable electron tunneling tip
spacing system comprising:

- a tunneling tip including a piezoelectric element connected to an end of the tunneling tip;
- a MEMS device including a conducting surface opposed the tunneling tip; and
- a single layer of C₆₀ fullerene between the tunneling tip and the MEMS device conducting surface, the single layer of C60 fullerene comprising a spacer layer for establishing a predetermined spacing between the tunneling tip and the MEMS device conducting surface.

Claim 13 (New): A system for providing a predetermined spacing between a conducting surface and a tunneling tip to form a tunneling device, comprising:

- a substrate including a conducting surface;
- a spacer layer having a predetermined thickness and having a first side and a second side, the first side of the spacer layer being disposed to contact the conducting surface;
- and
- a tunneling tip being disposed to contact the second side of the spacer layer, the tunneling tip being set in position opposed to the conducting surface to form a tunneling device,

wherein the distance between the tunneling tip and the conducting surface is the predetermined thickness.

Claim 14 (New): The system of Claim 13,

wherein the spacer layer comprises a monolayer of molecules with the predetermined thickness being the thickness of one molecule.

Claim 15 (New): The system of Claim 13,

wherein the predetermined thickness is one nanometer.

Claim 16 (New): The system of Claim 14,

wherein the spacer layer comprises C₆₀ fullerene.

Claim 17 (New): The system of Claim 13, further comprising:

an energy application member for applying energy to the substrate to cause a breakdown of the spacer layer between the tunneling tip and the conducting surface to produce a spacer layer residue.

Claim 18 (New): The system of Claim 17,

wherein the energy application member applies thermal energy.

Claim 19 (New): The system of Claim 17,

wherein the energy application member applies electrical energy.

Claim 20 (New): The system of Claim 17, further comprising:

a single event pipe containing a first gas for reacting with the spacer layer residue,
wherein when the single event pipe is opened the first gas is released to fill the cavity between the tunneling tip and the conducting surface, a predetermined portion of the first gas reacts with the spacer layer residue in the cavity between the tunneling tip and the conducting surface to produce a second gas.

Claim 21 (New): The system of Claim 20, further comprising:

a prefabricated sacrificial surface away from the tunneling device, the prefabricated sacrificial surface for adsorbing the first and second gases leaving the region around the tunneling tip free of adsorbed gases and spacer layer residue.

Claim 22 (New): The system of Claim 20,
wherein the first gas reacts with carbon byproducts.

Claim 23 (New): The system of Claim 20,
wherein the first gas is selected from the group comprising oxygen and hydrogen.